

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A semiconductor device ~~provided with a plurality of memory transistors comprising a memory transistor~~ comprising:

an active layer comprising a source region, a drain region and a channel forming region;

a first insulating film formed on the active layer;

a floating gate formed on the first insulating film;

a second insulating film formed on the floating gate; ~~and~~

a control gate formed on the second insulating film; ~~and~~

a first region and a second region included in the channel forming region,

~~means for intercepting charge injection from the first region to the floating gate;~~

~~means for carrying out charge injection from the second region to the floating gate; and~~

~~means for stopping charge injection from the second region to the floating gate.~~

wherein a thickness of the first insulating film on the second region is thinner than a thickness of the first insulating film on the first region.

2. (Canceled)

3. (Canceled)

4. (Original) A semiconductor device according to claim 1, wherein the memory transistor stores multi-value information.

5. (Original) A semiconductor device according to claim 1, wherein the memory transistor is formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

6. (Original) A semiconductor device according to claim 1, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.

7. (Currently Amended) A semiconductor device ~~provided with a plurality of memory transistors comprising a memory transistor comprising:~~

an active layer comprising a source region, a drain region and a channel forming region;

a first region and a second region formed in the channel forming region;

a first insulating film formed on the active layer;

a floating gate formed on the first insulating film;

a second insulating film formed on the floating gate; ~~and~~

a control gate formed on the second insulating film; and

a first region and a second region included in the channel forming region,

~~means for intercepting charge drawing from the floating gate to the first region;~~

~~means for carrying out charge drawing from the floating gate to the second region;~~

~~means for stopping charge drawing from the floating gate to the second region.~~

wherein a concentration of impurity elements in the first region is larger than a concentration of impurity elements in the second region.

8. (Canceled)

9. (Canceled)

10. (Original) A semiconductor device according to claim 7, wherein the memory transistor stores multi-value information.

11. (Original) A semiconductor device according to claim 7, wherein the memory transistor is formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

12. (Original) A semiconductor device according to claim 7, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.

13. (Currently Amended) A semiconductor device ~~provided with a plurality of memory cells comprising a memory cell in which first and second memory transistors are connected in series,~~ comprising:

an active layer comprising ~~a source region, a drain region, a first channel forming region of the first memory transistor and a second channel forming region of the second memory transistor;~~ a first channel forming region interposed between a source region and a source/drain region, and a second channel forming region interposed between the source/drain region and a drain region;

a first insulating film formed on the active layer;
 a first floating gate ~~of the first memory transistor~~ and a second floating gate ~~of the second memory transistor~~ formed on the first insulating film;
 a second insulating film formed on the first floating gate and the second floating ~~gates~~ gate; and
 a first control gate ~~of the first memory transistor~~ and a second control gate ~~of the second memory transistor~~ formed on the second insulating film,
 means for intercepting charge injection from the first channel forming region to the first floating gate;
 means for carrying out charge injection from the second channel forming region to the second floating gate; and
 means for stopping charge injection from the second channel forming region to the second floating gate,
 wherein a thickness of the first insulating film on the second channel forming region is thinner than a thickness of the first insulating film on the first channel forming region,
 wherein the first floating gate and second floating ~~gates~~ gate are connected to each other, and
 wherein the first control gate and second control ~~gates~~ gate are connected to each other.

14. (Canceled)

15. (Canceled)

16. (Currently Amended) A semiconductor device according to claim 13, wherein ~~the second memory transistor~~ the memory cell stores multi-value information.

17. (Currently Amended) The semiconductor device according to claim 13, wherein ~~the first and the second memory transistors are~~ the memory cell is formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

18. (Original) A semiconductor device according to claim 13, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.

19. (Original) A semiconductor device according to claim 13, wherein a threshold voltage of the first channel forming region is different from a threshold voltage of the second channel forming region.

20. (Canceled)

21. (Currently Amended) A semiconductor device ~~provided with a plurality of memory cells comprising a memory cell in which first and second memory transistors are connected in series,~~ comprising:

an active layer comprising ~~a source region, a drain region, a first channel forming region of the first memory transistor and a second channel forming region of the second memory transistor,~~ a first channel forming region interposed between a source region and a source/drain

region, and a second channel forming region interposed between the source/drain region and a drain region;

a first insulating film formed on the active layer;

a first floating gate ~~of the first memory transistor~~ and a second floating gate ~~of the second memory transistor~~ formed on the first insulating film;

a second insulating film formed on the first floating gate and second floating ~~gates~~ gate;

and

a first control gate ~~of the first memory transistor~~ and a second control gate ~~of the second memory transistor~~ formed on the second insulating film,

~~means for intercepting charge drawing from the first floating gate to the first channel forming region;~~

~~means for carrying out charge drawing from the second floating gate to the second channel forming region; and~~

~~means for stopping charge drawing from the second floating gate to the second channel forming region;~~

wherein a concentration of impurity elements in the first region is larger than a concentration of impurity elements in the second region,

wherein the first floating gate and second floating ~~gates~~ gate are connected to each other, and

wherein the first control gate and second control ~~gates~~ gate are connected to each other.

22. (Canceled)

23. (Canceled)

24. (Currently Amended) A semiconductor device according to claim 21, wherein ~~the second memory transistor~~ the memory cell stores multi-value information.

25. (Currently Amended) A semiconductor device according to claim 21, wherein ~~the first and the second memory transistors~~ the memory cell are formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

26. (Original) A semiconductor device according to claim 21, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.

27. (Original) A semiconductor device according to claim 21, wherein a threshold voltage of the first channel forming region is different from a threshold voltage of threshold channel forming region.

28. (Canceled)

29-42 (Canceled)

43. (New) A semiconductor device comprising a memory transistor comprising:
an active layer comprising a source region, a drain region and a channel forming region;
a first insulating film formed on the active layer;

a floating gate formed on the first insulating film;
a second insulating film formed on the floating gate;
a control gate formed on the second insulating film; and
a first region and a second region included in the channel forming region,
wherein a threshold voltage of the second region is larger than a threshold voltage of the first region, and
wherein the control gate is not contact with the first insulating film.

44. (New) A semiconductor device according to claim 43, wherein the memory transistor stores multi-value information.

45. (New) A semiconductor device according to claim 43, wherein the memory transistor is formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

46. (New) A semiconductor device according to claim 43, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.

47. (New) A semiconductor device comprising a memory cell comprising:
an active layer comprising a first channel forming region interposed between a source region and a source/drain region, and a second channel forming region interposed between the source/drain region and a drain region;

a first insulating film formed on the active layer;
a first floating gate and a second floating gate formed on the first insulating film;
a second insulating film formed on the first floating gate and second floating gate; and
a first control gate and a second control gate formed on the second insulating film,
wherein a threshold voltage of the second region is larger than a threshold voltage of the first region,
wherein the control gate is not contact with the first insulating film,
wherein the first floating gate and second floating gate are connected to each other, and
wherein the first control gate and second control gate are connected to each other.

48. (New) A semiconductor device according to claim 47, wherein the memory transistor stores multi-value information.

49. (New) A semiconductor device according to claim 47, wherein the memory transistor is formed on a substrate selected from the group consisting of a single crystal semiconductor substrate, a substrate having an insulating surface and a SOI substrate.

50. (New) A semiconductor device according to claim 47, wherein the semiconductor device is an electronic device selected from the group consisting of a video camera, a digital camera, a head-mount type of display, a DVD player, a game machine, a goggle type of display, a car navigation apparatus, an acoustic playback apparatus, a personal computer and a portable information terminal.